

AMENDMENTS TO THE CLAIMS

1. – 4. (Canceled)

5. (Previously Presented) A method for subcarrier selection for a system employing orthogonal frequency division multiple access (OFDMA) comprising:

a subscriber measuring channel and interference information for a plurality of subcarriers based on pilot symbols received from a base station, wherein the subscriber measuring channel and interference information comprises

the subscriber continuously monitoring reception of the pilot symbols known to the base station and measuring signal-plus-interference-to-noise ratio (SINR) of each cluster of subcarriers, and

the subscriber measuring intra-cell traffic;

the subscriber selecting a set of candidate subcarriers, wherein the subscriber selects candidate subcarriers based, at least in part, on the intra-cell traffic load balancing;

the subscriber providing feedback information on the set of candidate subcarriers to the base station; and

the subscriber receiving an indication of subcarriers of the set of subcarriers selected by the base station for use by the subscriber.

6. (Original) The method defined in Claim 5 further comprising the base station selecting the subcarriers in order to balance intra-cell traffic load on each cluster.

7. – 8. (Canceled)

9. (Previously Presented) A method for subcarrier selection for a system employing orthogonal frequency division multiple access (OFDMA) comprising:

- a subscriber measuring channel and interference information for a plurality of subcarriers based on pilot symbols received from a base station, wherein the subscriber measuring channel and interference information comprises using information from pilot symbol periods and data periods to measure channel and interference information;
- the subscriber selecting a set of candidate subcarriers based on the SINR of a cluster of subcarriers and a difference between measured power corresponding to each cluster during pilot periods and measured power during data periods;
- the subscriber providing feedback information on the set of candidate subcarriers to the base station; and
- the subscriber receiving an indication of subcarriers of the set of subcarriers selected by the bas station for use by the subscriber.

10. (Original) The method defined in Claim 9 further comprising the subscriber using the power difference to distinguish, during selection, clusters of subcarriers having substantially similar SINRs.

11. (Previously Presented) A method for subcarrier selection for a system employing orthogonal frequency division multiple access (OFDMA) comprising:

- a subscriber measuring channel and interference information for a plurality of subcarriers based on pilot symbols received from a base station, wherein the subscriber measuring channel and interference information comprises
 - using information from pilot symbol periods and data periods to measure channel and interference information, and
 - using information from pilot symbol periods and data traffic periods to analyze presence of intra-cell traffic load and inter-cell interference;
- the subscriber selecting a set of candidate subcarriers;
- the subscriber providing feedback information on the set of candidate subcarriers to the base station; and
- the subscriber receiving an indication of subcarriers of the set of subcarriers selected by the base station for use by the subscriber.

12. – 20. (Canceled)

21. (Previously Presented) A method for subcarrier selection for a system employing orthogonal frequency division multiple access (OFDMA) comprising:

- a subscriber measuring channel and interference information for a plurality of subcarriers based on pilot symbols received from a base station;
- the subscriber selecting a set of candidate subcarriers;
- the subscriber providing feedback information on the set of candidate subcarriers to the base station, wherein providing feedback information comprises arbitrarily ordering the set of candidate of subcarriers as clusters of subcarriers, and further wherein the feedback information includes an index indication of a candidate cluster with its SINR value; and
- the subscriber receiving an indication of subcarriers of the set of subcarriers selected by the base station for use by the subscriber.

22. (Original) The method defined in Claim 21 wherein each index is indicative of a coding and modulation rate.

23. (Canceled)

24. (Previously Presented) A method for subcarrier selection for a system employing orthogonal frequency division multiple access (OFDMA) comprising:

- a subscriber measuring channel and interference information for a plurality of subcarriers based on pilot symbols received from a base station;
- the subscriber selecting a set of candidate subcarriers;
- the subscriber providing feedback information on the set of candidate subcarriers to the base station;
- the subscriber sending an indication of coding and modulation rates that the subscriber desires to employ for each cluster; and
- the subscriber receiving an indication of subcarriers of the set of subcarriers selected by the base station for use by the subscriber.

25. (Original) The method defined in Claim 24 wherein the indication of coding and modulation rates comprises an SINR index indicative of a coding and modulation rate.

26. – 27. (Canceled)

28. (Currently Amended) A The method defined in Claim 26 for subcarrier selection for a system employing orthogonal frequency division multiple access (OFDMA) comprising:

a subscriber measuring channel and interference information for a plurality of subcarriers based on pilot symbols received from a base station;

the subscriber selecting a set of candidate subcarriers;

the subscriber providing feedback information on the set of candidate subcarriers to the base station;

the subscriber receiving an indication of subcarriers of the set of subcarriers selected by the base station for use by the subscriber;

the base station allocating a first portion of the subcarriers to establish a data link between the base station and the subscriber; and then

the base station allocating a second portion of the subcarriers to the subscriber to increase communication bandwidth wherein, due to subscriber priority, the base station allocates the second portion before allocating each subscriber in the cell subcarriers to establish their data link to the base station.

29. (Previously Presented) An apparatus comprising:

a plurality of subscribers in a first cell to generate feedback information indicating clusters of subcarriers desired for use by the plurality of subscribers; and

a first base station in the first cell, in response to receiving inter-cell interference information, coordinates with other cells to make a cluster assignment decision, the first base station performing subcarrier allocation for OFDMA to allocate OFDMA subcarriers in clusters to the plurality of subscribers based on inter-cell interference avoidance and intra-cell traffic load balancing in response to the feedback information.

30. – 33. (Canceled)

34. (Previously Presented) An apparatus comprising:
a plurality of subscribers in a first cell to generate feedback information indicating clusters of subcarriers desired for use by the plurality of subscribers; and
a first base station in the first cell, the first base station to allocate OFDMA subcarriers in clusters to the plurality of subscribers;
each of a plurality of subscribers to measure channel and interference information for the plurality of subcarriers based on pilot symbols received from the first base station, wherein each of the plurality of subscribers continuously monitors reception of the pilot symbols known to the base station and the plurality of subscribers, measures signal-plus-interference-to-noise ratio (SINR) of each cluster of subcarriers and measures intra-cell traffic, and further wherein at least one subscriber of the plurality of subcarriers based, at least in part, on the intra-cell traffic load balancing, and the one subscriber to provide feedback information on the set of candidate subcarriers to the base station and to receive an indication of subcarriers from the set of subcarriers selected by the first base station for use by the one subscriber.

35. (Original) The apparatus defined in Claim 34 wherein the base station selects subcarriers in order to balance intra-cell traffic load on each cluster of subcarriers.

36. – 37. (Canceled)

38. (Previously Presented) An apparatus comprising:
a plurality of subscribers in a first cell to generate feedback information indicating clusters of subcarriers desired for use by the plurality of subscribers; and
a first base station in the first cell, the first base station to allocate OFDMA subcarriers in clusters to the plurality of subscribers;
each of a plurality of subscribers to measure channel and interference information for the plurality of subcarriers based on pilot symbols received from the first base station, wherein at least one subscriber of the plurality of subscribers select a set of candidate subcarriers from the plurality of subcarriers based, at least in part, on SINR of the cluster and a difference between measured power corresponding to each cluster during pilot periods and measured power during data periods, and the one subscriber to provide feedback information on the set of candidate subcarriers to the base station and to receive an indication of subcarriers from the set of subcarriers selected by the first base station for use by the one subscriber.

39. (Original) The apparatus defined in Claim 38 wherein the one subscriber distinguishes, during selection, cluster of subcarriers having substantially similar SINRs based on the power difference.

40. (Original) The apparatus defined in Claim 38 wherein the at least one subscriber uses information from pilot symbol periods and data traffic periods to analyze presence of intra-cell traffic load and inter-cell interference.

41. (Original) The apparatus defined in Claim 38 wherein the pilot symbols occupy an entire OFDM frequency bandwidth.

42. (Original) The apparatus defined in Claim 41 wherein at least one other pilot symbol from a different cell transmitted at the same time as the pilot symbols received from the base station collide with each other.

43. – 49. (Canceled)

50. (Previously Presented) An apparatus comprising:
a plurality of subscribers in a first cell to generate feedback information indicating clusters of subcarriers desired for use by the plurality of subscribers; and
a first base station in the first cell, the first base station to allocate OFDMA subcarriers in clusters to the plurality of subscribers;
each of a plurality of subscribers to measure channel and interference information for the plurality of subcarriers based on pilot symbols received from the first base station and at least one of the plurality of subscribers to select a set of candidate subcarriers from the plurality of subcarriers, and the one subscriber to provide feedback information on the set of candidate subcarriers to the base station and to receive an indication of subcarriers from the set of subcarriers selected by the first base station for use by the one subscriber, wherein the plurality of subscribers provide feedback information that comprises an arbitrarily ordered set of candidate subcarriers as clusters of subcarriers, and further wherein the feedback information includes an index indication of a candidate cluster with its SINR value.

51. (Original) The apparatus defined in Claim 50 wherein each index is indicative of a coding and modulation rate.

52. (Canceled)

53. (Previously Presented) An apparatus comprising:
a plurality of subscribers in a first cell to generate feedback information indicating clusters of subcarriers desired for use by the plurality of subscribers; and
a first base station in the first cell, the first base station to allocate OFDMA subcarriers in clusters to the plurality of subscribers;
each of a plurality of subscribers to measure channel and interference information for the plurality of subcarriers based on pilot symbols received from the first base station and at least one of the plurality of subscribers to select a set of candidate subcarriers from the plurality of subcarriers, and the one subscriber to provide feedback information on the set of candidate subcarriers to the base station and to receive an indication of subcarriers from the set of subcarriers selected by the first base station for use by the one subscriber, wherein the one subscriber sends an indication of coding and modulation rates that the one subscriber desires to employ.

54. (Original) The apparatus defined in Claim 53 wherein the indication of coding and modulation rates comprises an SINR index indicative of a coding and modulation rate.

55. – 56. (Canceled)

57. (Currently Amended) ~~An~~ ~~The apparatus defined in Claim 55 wherein,~~
comprising:

a plurality of subscribers in a first cell to generate feedback information indicating clusters of subcarriers desired for use by the plurality of subscribers; and

a first base station in the first cell, the first base station to allocate OFDMA subcarriers in clusters to the plurality of subscribers; and

each of a plurality of subscribers to measure channel and interference information for the plurality of subcarriers based on pilot symbols received from the first base station and at least one of the plurality of subscribers to select a set of candidate subcarriers from the plurality of subcarriers, and the one subscriber to provide feedback information on the set of candidate subcarriers to the base station and to receive an indication of subcarriers from the set of subcarriers selected by the first base station for use by the one subscriber;

wherein the base station allocates a first portion of the subcarriers to establish a data link between the base station, the bas station allocates a second portion of the subcarriers to the subscriber to increase communication bandwidth, and due to subscriber priority, the base station allocates the second portion before allocating each subscriber in the cell subcarriers to establish their data link to the base station.

58. – 62. (Canceled)